Remarks

Amendments to the Claims

Claim 3 is canceled.

Claims 17-22 have been subject to a restriction requirement. They are canceled, subject to applicants' right to file a divisional application, to better place the case in condition for allowance.

The Claim Rejections

Claims 1-6, 8, and 11-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Branch et al. (US 3,219,789).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Branch et al (US 3,219,789) as applied to claim 6 above, and further in view of Corby, Jr. et al (US 4,532,405)

Claims 9-10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Branch et al (US 3,219,789) as applied to claim 8 above, and further in view of Berg et al (US 6,888,972 B2).

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Branch et al (US 3,219,789) as applied to claim 14 above, and further in view of Corby, Jr. et al (US 4,532,405).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Branch et al (US 3,219,789) as applied to claim 14 above, and further in view of Berg et al (US 6,888,972 B2).

Reasons for Withdrawing the Claim Rejections.

Applicants' method claims 1, 2 and 4-16 recite methods in which a flexible and articulate tubular device is used in welding operations. The methods are used in situations where a weld track is progressively formed, such as by relative motion between a welding apparatus and a workpiece(s). The claimed methods are particularly useful when a shielding gas is to be provided inside open-ended, overlapping tubes as illustrated in Figure 2 or inside a leg of a

branched tube as illustrated in Figure 3 of applicants' drawings. The flexible and articulated tubular device is inserted and positioned, and the gas-delivering terminus is articulated to follow the progressively forming weld and to deliver a gaseous flux over the molten metal.

The claimed methods all use an articulated device where the gas-delivering terminus is articulated to deliver the shielding gas. This means that the methods are practiced with a device such as the device illustrated in Figures 2-4 of the drawings. For example, an articulated device has joints like the group of sinusoidal and touching pivot rings 62 described in the specification in description of Figure 4. This articulated flexibility of the shielding gas delivery device permits it to be manipulated with, for example, control wires 66 in response, for example, to visual signals or temperature signals in following the formation of the metal fusion weld in a difficult-to-reach location.

As recited in independent claims 1 and 13, the flexible tube has an inlet at one end for receiving a supply of gaseous flux. The gaseous flux is conducted through the tube to a terminus at the other tube end for discharge of the gas toward a target weld path. The flexible tube is articulated to direct the terminus of the device at the advancing weld path and preferably at the leading edge of a weld bead (claims 2, 6, 8, and 14). In preferred embodiments, visual signals from the terminus of the device are used in positioning the terminus of the tube at the weld track (claims 7 and 15). And, in other preferred embodiments, thermal signals are used in directing the motion of the terminus of the articulate tube in following the weld track (claims 9, 10, and 16).

The methods of claims 1, 2, and 4-16 are different form any method taught or suggested by the Branch et al '789 patent or any combination of Branch et al (hereafter Branch for brevity) with the Corby, Jr. et al '405 patent or Berg et al '972 patent.

The Branch welding apparatus cannot be articulated and flexed in accordance with any of applicants' method claims 1-6, 8, or 11-14. The Branch apparatus cannot be flexed for insertion into different workpiece shapes requiring welding. The Branch apparatus and method are specific to the illustrated welding situation. The Branch gas delivery device cannot be articulated to follow a bend in a tube as required by the practice of applicants' invention illustrated in Figure 3. The Branch apparatus cannot be inserted along the axis of an open tube and articulated to follow a weld as illustrated in Figure 2 of applicants' specification.

The Branch apparatus is folded for insertion or into the cylindrical vessel portions 11 and 12 of Branch's Figure 1. A flexible tube 44 permits folding of welding gas delivery tube 45 against mounting rod 25. But in Branch's welding operation, tube 45 is rigid and is simply rotated by rod 25 in a planar circular arc to follow weld metal 14. Branch does not deliver shielding gas through a terminus that is articulated to deliver the gas. Branch does not disclose a method in which a shielding gas for welding is conducted from an inlet end of a flexible articulate tube to a terminus at the other end. The Branch disclosure does not contemplate a method of articulating (moving) the terminus of a flexible tube to continually follow an advancing weld track formed by relative motion between the welding apparatus and the assembly of components. The disclosure of Branch does not anticipate the subject matter of any of claims 1-6, 8, or 11-14 and the Section 102 (b) rejection based on Branch should be withdrawn.

Applicants' claims 7 and 15 recite methods in which visual signals are conveyed from the terminus of the flexible tube and used in moving the terminus to follow the progressing welding track. The Branch disclosure is combined with the Corby, Jr. disclosure in rejection of claims 7 and 15. But Branch does not disclose the methods recited in applicants' base claims. Branch does not disclose (or require) the use of visual or temperature signals to follow a welding operation, he can use a simple mechanical linkage between the enclosed tube 45 and the not-illustrated welding apparatus. And Corby does not contemplate the use of a separate shielding gas delivery device to track a progressing weld track. Corby uses an integral welder and gas delivery apparatus that also contains optics for assessing the weld. But no combination of Branch and Corby teaches or suggest applicants' methods of delivering shielding gas through a separate flexible articulate delivery tube and using visual signals from the terminus of the tube to direct the tube along a progressing weld track. The rejection of claims 7 and 15 should be withdrawn.

Applicants' claims 9, 10 and 16 recite methods in which temperature measurements are conveyed from the terminus of the flexible tube and used in guiding the terminus to follow the progressing welding track. The Branch disclosure is combined with the Berg or Berg and Corby, Jr. disclosures in rejection of these claims. But, again, Branch does not disclose the methods recited in applicants' base claims and does not suggest the need of temperature data for rotation of tube 45. And neither Berg nor Corby contemplates the use of a separate shielding gas

delivery device to track a progressing weld track. No combination of Branch and Corby, or no combination of Branch, Corby and Berg teaches or suggest applicants' methods of delivering shielding gas through a separate flexible articulate delivery tube and using temperature signals from the terminus of the tube to direct the tube along a progressing weld track.

It is respectfully requested that each rejection of applicants' claims 1, 2, and 4-16 be reconsidered and that they be allowed and this case passed to issue.

Respectfully Submitted,

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I hereby certify that this correspondence is, on the date shown below, being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on: 3/08/06.

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